

Assignment -1

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Question-1:

Make smart home with atleast 2 sensors and led, buzzer. in tinkercad.

CODE :

```
#include <Servo.h>

int output1Value = 0; int
sen1Value = 0; int
sen2Value = 0; int const
gas_sensor = A1; int const
LDR = A0; int limit = 400;

long readUltrasonicDistance(int triggerPin, int echoPin)
{
    pinMode(triggerPin, OUTPUT); // Clear the trigger
    digitalWrite(triggerPin, LOW); delayMicroseconds(2);
    // Sets the trigger pin to HIGH state for 10 microseconds
    digitalWrite(triggerPin, HIGH); delayMicroseconds(10);
    digitalWrite(triggerPin, LOW); pinMode(echoPin,
    INPUT);

    // Reads the echo pin, and returns the sound wave travel time in microseconds
    return pulseIn(echoPin, HIGH);
}

Servo servo_7;

void setup()
{
    Serial.begin(9600);          //initialize serial communication
    pinMode(A0, INPUT);          //LDR
    pinMode(A1, INPUT);          //gas sensor
    pinMode(13, OUTPUT);          //connected to relay
    servo_7.attach(7, 500, 2500); //servo motor
```

```
pinMode(8,OUTPUT);      //signal to piezo buzzer
pinMode(9, INPUT);      //signal to PIR
pinMode(10, OUTPUT);    //signal to npn as switch
pinMode(4, OUTPUT);     //Red LED
pinMode(3, OUTPUT);     //Green LED

}
```

```
void loop()
```

```
{
```

```
    //-----light intensity control-----//
```

```
//-----
```

```
    int val1 = analogRead(LDR);
```

```
    if (val1 > 500)
```

```
    {
```

```
        digitalWrite(13, LOW);
```

```
        Serial.print("Bulb ON = ");
```

```
        Serial.print(val1);
```

```
    }
```

```
    else
```

```
    {
```

```
        digitalWrite(13, HIGH);
```

```
        Serial.print("Bulb OFF = ");
```

```
        Serial.print(val1);
```

```
    }
```

```
//-----
```

```
    //----- light & fan control -----//
```

```
//-----
```

```

sen2Value = digitalRead(9);
if (sen2Value == 0)
{
    digitalWrite(10, LOW); //npn as switch OFF    digitalWrite(4,
HIGH); // Red LED ON,indicating no motion    digitalWrite(3, LOW);
//Green LED OFF, since no Motion detected
    Serial.print("  || NO Motion Detected  ");
}

if (sen2Value == 1)
{
    digitalWrite(10, HIGH); //npn as switch ON
    delay(3000);    digitalWrite(4, LOW); // RED LED OFF
    digitalWrite(3, HIGH); //GREEN LED ON , indicating motion detected
    Serial.print("  || Motion Detected!  ");
}
delay(300);

//-----
// ----- Gas Sensor -----// -----
int val = analogRead(gas_sensor); //read sensor value
Serial.print(" || Gas Sensor Value = ");
Serial.print(val); //Printing in serial monitor
//val = map(val, 300, 750, 0, 100);
if (val > limit)
{
    tone(8, 650);
}
delay(300);
noTone(8);

```

```

//-----
//----- servo motor -----//
//-----

sen1Value = 0.01723 * readUltrasonicDistance(6, 6);

if (sen1Value < 100)
{
    servo_7.write(90);
    Serial.print("  || Door Open! ; Distance = ");
    Serial.print(sen1Value);
    Serial.print("\n");

}
else
{
    servo_7.write(0);
    Serial.print("  || Door Closed! ; Distance = ");
    Serial.print(sen1Value);
    Serial.print("\n");
}
delay(10); // Delay a little bit to improve simulation performance
}

```

```

1  #include <Servo.h>
2
3  int output1Value = 0;
4  int sen1Value = 0;
5  int sen2Value = 0;
6  int const gas_sensor = A1;
7  int const LDR = A0;
8  int limit = 400;
9
10 long readUltrasonicDistance(int triggerPin, int echoPin)
11 {
12     pinMode(triggerPin, OUTPUT); // Clear the trigger
13     digitalWrite(triggerPin, LOW);
14     delayMicroseconds(2);
15     // Sets the trigger pin to HIGH state for 10 microseconds
16     digitalWrite(triggerPin, HIGH);
17     delayMicroseconds(10);
18     digitalWrite(triggerPin, LOW);
19     pinMode(echoPin, INPUT);
20     // Reads the echo pin, and returns the sound wave travel time in microseconds
21     return pulseIn(echoPin, HIGH);
22 }
23
24 Servo servo_7;
25
26 void setup()

```

```

26 void setup()
27 {
28     Serial.begin(9600); //initialize serial communication
29     pinMode(A0, INPUT); //LDR
30     pinMode(A1, INPUT); //gas sensor
31     pinMode(13, OUTPUT); //connected to relay
32     servo_7.attach(7, 500, 2500); //servo motor
33
34     pinMode(8, OUTPUT); //signal to piezo buzzer
35     pinMode(9, INPUT); //signal to PIR
36     pinMode(10, OUTPUT); //signal to npn as switch
37     pinMode(4, OUTPUT); //Red LED
38     pinMode(3, OUTPUT); //Green LED
39
40 }
41
42 void loop()
43 {
44
45     //-----light intensity control-----//
46     //-----
47     int val1 = analogRead(LDR);
48     if (val1 > 500)
49     {
50         digitalWrite(13, LOW);
51         Serial.print("Bulb ON = ");
52         Serial.print(val1);
53     }
54 }

```

Serial Monitor

```

51     Serial.print("Bulb ON = ");
52     Serial.print(val1);
53 }
54 else
55 {
56     digitalWrite(13, HIGH);
57     Serial.print("Bulb OFF = ");
58     Serial.print(val1);
59 }
60
61 //-----
62 //----- light & fan control -----//
63 //-----
64 sen2Value = digitalRead(9);
65 if (sen2Value == 0)
66 {
67     digitalWrite(10, LOW); //npn as switch OFF
68     digitalWrite(4, HIGH); // Red LED ON, indicating no motion
69     digitalWrite(3, LOW); //Green LED OFF, since no Motion detected
70     Serial.print("    || NO Motion Detected    " );
71 }
72
73 if (sen2Value == 1)
74 {
75     digitalWrite(10, HIGH); //npn as switch ON
76     delay(3000);
77     digitalWrite(4, LOW); // RED LED OFF

```

```

76     delay(3000);
77     digitalWrite(4, LOW); // RED LED OFF
78     digitalWrite(3, HIGH); //GREEN LED ON , indicating motion detected
79     Serial.print("    || Motion Detected!    " );
80 }
81 delay(300);
82
83 //-----
84 // ----- Gas Sensor -----//
85 //-----
86 int val = analogRead(gas_sensor); //read sensor value
87 Serial.print("|| Gas Sensor Value = ");
88 Serial.print(val); //Printing in serial monitor
89 //val = map(val, 300, 750, 0, 100);
90 if (val > limit)
91 {
92     tone(8, 650);
93 }
94 delay(300);
95 noTone(8);
96
97 //-----
98 //----- servo motor -----//
99 //-----
100 sen1Value = 0.01723 * readUltrasonicDistance(6, 6);
101

```

```

93     }
94     delay(300);
95     noTone(8);
96
97     //----- servo motor -----//
98     //-----
99
100    senlValue = 0.01723 * readUltrasonicDistance(6, 6);
101
102    if (senlValue < 100)
103    {
104        servo_7.write(90);
105        Serial.print("    || Door Open!  ; Distance = ");
106        Serial.print(senlValue);
107        Serial.print("\n");
108    }
109
110    else
111    {
112        servo_7.write(0);
113        Serial.print("    || Door Closed! ; Distance = ");
114        Serial.print(senlValue);
115        Serial.print("\n");
116    }
117    delay(10); // Delay a little bit to improve simulation performance
118 }

```

OUTPUT

